PATENT SPECIFICATION

263,897

Application Date: July 24, 1925. No. 18,912/25.

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PROVISIONAL SPECIFICATION.

Improvements in or relating to the Heat Treatment of Cereal Substances.

We, CHARLES WOODLAND CHITTY, British subject, DOUGLAS WILLIAM KENT-JONES, B.Sc.(London), F.I.C., British subject, and WOODLANDS LIMITED, a British company, all of Charlton Green, Dover, in the County of Kent, do hereby declare the nature of this invention to be as follows:—

This invention comprises improvements in or relating to the heat treatment of cereal substances and is in the nature of a development of the invention described in British Patent Specification No. 228,829. According to the said specification flour or wheat are dry-heated to a point at which substantially all the contained gluten is rendered non-retainable in a washing test, and a proportion of the cereal so treated is blended with a proportion of cereal not so treated with the result that the blend possesses superior strength as compared with untreated flour or wheat.

We have found by experiment that if the treatment described in the prior specification is merely carried to the point at which all the gluten is rendered non-retainable in a washing test it is necessary to blend the treated flour into the untreated flour in a proportion of approximately 15% or more in order to obtain any substantial advantage by the process.

We have now found, however, that if the heat treatment is continued for a considerable time longer it becomes possible to obtain similar increases in strength by the employment of much smaller quantities of heat-treated wheat or flour and in fact the cereal can be brought to a point at which its action is very similar to that of the well known "improvers" which are frequently added to the flour for the purpose of increasing its strength.

According to the present invention therefore a wheaten cereal is dry-heated for a considerable time beyond that necessary to render the whole of the gluten non-retainable in a washing test (so, however, that the starch particles are not gelatinised), and until the gluten becomes so affected as to render the cereal capable of use as an "improver".

In one example of carrying this invention into effect Manitoba flour was heated to a temperature of 180° F. for 14 hours. It was then found that the addition of the so heated flour to ordinary flour in a proportion of 2 lbs. per sack of flour led to a striking increase in the "strength" of the whole flour, similar to that which would be obtained by the addition of a chemical "improver", but of course without being subject to the objections which are raised in some quarters against the use of chemicals in flour. Similar results have been obtained by a treatment of 212° F. for 8—9 hours.

The best results are obtained on glutinous flours.

Similar results can be obtained by the treatment of wheat in berry form.

It is to be noted that owing to the very much smaller quantity of the improver required to produce a given effect according to the present invention, less actual heat is needed for producing the improvement than is expended in the treatment according to the said prior British Patent No. 228,829.

Dated this 24th day of July, 1925.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C. 1,
Chartered Patent Agents.

[*Price* 1/-]

COMPLETE SPECIFICATION.

Improvements in or relating to the Heat Treatment of Cereal Substances.

We, CHARLES WOODLAND CHITTY, British subject, DOUGLAS WILLIAM KENT-JONES, B.Sc.(London), F.I.C., a British subject, and WOODLANDS LIMITED, a British company, all of Charlton Green, Dover, in the County of Kent, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention comprises improvements in or relating to the heat treatment of cereal substances and is in the nature of a development of the invention described in British Patent Specification No. 228,829. According to the said specification flour or wheat are dry-heated to a point at which substantially all the contained gluten is rendered non-retainable in a washing test, and a proportion of the cereal so treated is blended with a proportion of cereal not so treated with the result that the blend possesses superior strength as compared with untreated flour or wheat.

We have found by experiment that if the treatment described in the prior specification is merely carried to the point at which all the gluten is rendered non-retainable in a washing test it is necessary to blend the treated flour into the untreated flour in a proportion of approximately 15% or more in order to obtain any substantial advantage by the process.

We have now found, however, that if the heat treatment is continued for a considerably longer period it becomes possible to obtain similar increases in strength by the employment of much smaller quantities of heat-treated wheat or flour and in fact the cereal can be brought to a point at which its action is very similar to that of the well known "improvers" which are frequently added to the flour for the purpose of increasing its strength.

The present invention comprises a process of heat-treatment of a wheaten cereal to produce a flour improver, wherein the cereal is dry-heated for a time sufficient to render the whole of the gluten non-retainable in a washing test and thereafter is further heated for a considerable period longer so that the gluten is so affected that the flour can no longer be made into dough by mixing with water and so that the cereal undergoes a marked physico-chemical change and acquires the property of markedly increasing the strength of flour when mixed therewith in the form of flour in small proportions such as herein referred to (for example down to 1% or less).

The heat-treatment may exceed seven hours at a temperature lying between 170 and 200° F. If the temperature is less than that mentioned the time taken to obtain the results is somewhat excessive and involves a corresponding waste of heat, while if the temperature is too elevated there is a tendency for the flour to become sufficiently affected in colour to impart a tinge to flour with which it is blended. At the higher temperatures the period required is shorter. Preferably the cereal is heated in the form of flour, as the best results have been so obtained. The best flours to employ are glutinous flours. Wheat in berry form, however, or the products intermediate between wheat and flour, such as semolina, can be employed if desired.

By the term "dry-heating" in the specification it is intended to exclude heating in an atmosphere of steam, or an atmosphere containing considerable quantities of water-vapour, such heating having the effect of gelatinising the starch in the cereal. The process according to the present invention does not involve gelatinisation of the starch, which is deleterious to the desired effect and must not be allowed to take place to any substantial extent. Nevertheless the wheat or flour may contain a certain amount of moisture, as is usual with cereal substances. Preferably such moisture is limited so as not to exceed 15% as determined in a water oven at 100° C. during the heating and the period of heating is limited so that the starch in the cereal is not gelatinised notwithstanding the presence of the moisture.

It is preferred to limit the temperature of treatment so as not to exceed 185° F.

In one example of carrying this invention into effect Manitoba flour was heated to a temperature of 180° F. for 8 hours. It was then found that the addition of the

so heated flour to ordinary flour in a proportion of 2 lbs. per sack of flour led to a striking increase in the " strength " of the whole flour, similar to that which would be obtained by the addition of a chemical " improver ", but of course without being subject to the objections which are raised in some quarters against the use of chemicals in flour. Similar results have been obtained by a treatment at 212° F. for 6 hours.

In another example of the process the flour was heated at the same temperature for 60 hours and as a result it was found that 1½ lbs. per sack of the treated flour was sufficient as an addition to ordinary flour to effect the desired increase in " strength ". However, it will be evident that it is more economical to heat as hereinabove described for 8—10 hours and use a slightly larger quantity of flour.

It is to be noted that owing to the very much smaller quantity of the improver required to produce a given effect according to the present invention, less actual heat is needed for producing the improvement than is expended in the treatment according to the said prior British Patent No. 228,829.

We are aware of the Specifications of British Patents Numbers 1269 of 1884 and 25,809 of 1907 and we make no claim to anything described or claimed therein.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A process of heat treatment of a wheaten cereal to produce a flour improver, wherein the cereal is dry-heated for a time sufficient to render the whole of the gluten non-retainable in a washing test and thereafter is further heated for a considerable period longer for the purposes hereinbefore described so that the cereal acquires the property of markedly increasing the strength of flour when mixed therewith in the form of flour in small proportions such as herein referred to (for example down to 1% or less).

2. A process for improving the strength of a wheaten cereal wherein a small portion of cereal is taken apart from the main body thereof and is acted upon by dry heat until the whole of the gluten is rendered non-retainable in a washing-test and is then further heated for a considerable time for the purposes hereinbefore described sufficient to give to it the hereinbefore described strengthening property and is thereafter blended with the main body of the cereal.

3. A process of heat treatment of a wheaten cereal as claimed in Claim 1 or Claim 2 wherein the heat treatment exceeds seven hours at a temperature lying between 170° and 200° F.

4. A process of heat treatment of a wheaten cereal as claimed in Claim 1 or Claim 2 or Claim 3 wherein the cereal is heated in the form of flour.

5. A process of heat treatment of a wheaten cereal according to Claim 1 or Claim 2 or Claim 3 or Claim 4 wherein the cereal contains water not exceeding 15% during the heating but the period of heating is limited so that the starch in the cereal is not gelatinised.

6. A process of heat treatment of a wheaten cereal as claimed in any one of the preceding claims wherein the temperature of treatment is limited so as not to exceed 185° F.

7. Wheaten cereal products prepared or produced by any one of the special processes hereinbefore described and claimed.

Dated this 18th day of May, 1926.

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Chartered Patent Agents.

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